

CLAIMS

What is claimed is:

- 1 1. A method for performing a database operation, comprising the computer-implemented steps of:
 - 3 receiving a database query that specifies an operation for manipulating data;
 - 4 in response to receiving said database query, performing the steps of,
 - 5 retrieving data from a relational structure;
 - 6 storing the data in a non-relational structure that can be addressed as a
 - 7 multi-dimensional array; and
 - 8 performing said operation specified in the database query on said data.
 - 1 2. The method of Claim 1, wherein the step of storing the data in a structure comprises the step of storing the data in a structure that can be symbolically addressed as an n-dimensional array.
 - 1 3. The method of Claim 1, further comprising the step of presenting in tabular format results from performing said operation.
 - 1 4. The method of Claim 1, wherein the step of performing said operation comprises the step of automatically reordering the specified operations to allow the operation to be correctly performed on said data stored in said non-relational structure.
 - 1 5. The method of Claim 1, wherein the step of performing said operation comprises the step of aggregating over a set of data information contained in multiple cells of said non-relational structure.
 - 1 6. The method of Claim 1, wherein the step of performing said operation comprises the step of repeatedly performing a series of manipulations on said data until a particular criterion is satisfied.

1 7. A method for processing database query operations, comprising the computer-implemented steps of:
2
3 in response to receiving a database query that specifies an operation for
4 manipulating data, performing the steps of,
5 referencing data in a relational structure as if the data was stored in a
6 multi-dimensional array;
7 retrieving the data from said relational structure; and
8 performing said operation previously specified in said database query.

1 8. The method of Claim 7, wherein:
2 the step of receiving a database query that specifies an operation comprises the
3 step of receiving a multi-dimensional array operation; and
4 the step of referencing data in a relational structure comprises the step of
5 referencing said data using said multi-dimensional array operation.

1 9. The method of Claim 7, wherein the step of retrieving the data comprises the step
2 of retrieving the data from one or more relational database tables.

1 10. The method of Claim 7, further comprising the step of storing said data in a non-relational structure; and
2
3 wherein the step of performing said operation comprises the step of performing
4 said operation in reference to said data stored in said non-relational
5 structure.

1 11. The method of Claim 7, wherein the step of performing said operation comprises
2 the step of repeatedly performing a series of manipulations on said data until a
3 particular criteria is satisfied.

- 1 12. A method for processing database query operations, comprising the computer-
2 implemented steps of:
3 in response to receiving a database query that specifies an operation for
4 manipulating data, performing the steps of,
5 retrieving a first set of data from a first relational structure;
6 storing the first set of data in a non-relational structure; and
7 manipulating the first set of data by performing the operation previously
8 specified in the database query.
- 1 13. The method of Claim 12, wherein the step of retrieving a first set of data from a
2 first relational structure comprises the step of retrieving said first set of data from
3 a relational database.
- 1 14. The method of Claim 13, wherein the step of retrieving said first set of data from a
2 relational database comprises the step of retrieving said first set of data from one
3 or more tables within said a relational database.
- 1 15. The method of Claim 12, wherein the step of storing the first set of data in a non-
2 relational structure comprises the step of storing the first set of data within a
3 spreadsheet application.
- 1 16. The method of Claim 12, wherein the step of storing the first set of data in a non-
2 relational structure comprises the step of storing the first set of data in a non-
3 relational database application.
- 1 17. The method of Claim 12, wherein the step of storing the first set of data in a non-
2 relational structure comprises the step of storing the first set of data within an n-
3 dimensional array data structure.

- 1 18. The method of Claim 12, wherein the step of manipulating the first set of data
2 comprises the steps of symbolically addressing the first set of data as n-
3 dimensional array information.
- 1 19. The method of Claim 12, further comprising the step of, after performing the step
2 of manipulating the first set of data, storing in a second relational structure, result
3 information based on performance of said operation.
- 1 20. The method of Claim 12, wherein the step of manipulating the first set of data
2 comprises the step of repeatedly performing a series of manipulations on said first
3 set of data until a particular criteria is satisfied.
- 1 21. A computer-readable medium carrying one or more sequences of instructions for
2 performing a database operation, wherein execution of the one or more sequences
3 of instructions by one or more processors causes the one or more processors to
4 perform the steps of:
5 receiving a database query that specifies an operation for manipulating data;
6 in response to receiving said database query, performing the steps of,
7 retrieving data from a relational structure;
8 storing the data in a non-relational structure that can be addressed as a
9 multi-dimensional array; and
10 performing said operation specified in the database query on said data.
- 1 22. The computer-readable medium of Claim 21, wherein the step of storing the data
2 in a structure comprises the step of storing the data in a structure that can be
3 symbolically addressed as an n-dimensional array.

- 1 23. The computer-readable medium of Claim 21, further comprising instructions for
2 performing the step of presenting in tabular format results from performing said
3 operation.
- 1 24. The computer-readable medium of Claim 21, wherein the step of performing said
2 operation comprises the step of automatically reordering the specified operations
3 to allow the operation to be correctly performed on said data stored in said non-
4 relational structure.
- 1 25. The computer-readable medium of Claim 21, wherein the step of performing said
2 operation comprises the step of aggregating over a set of data information
3 contained in multiple cells of said non-relational structure.
- 1 26. The computer-readable medium of Claim 21, wherein the step of performing said
2 operation comprises the step of repeatedly performing a series of manipulations on
3 said data until a particular criterion is satisfied.
- 1 27. A computer-readable medium carrying one or more sequences of instructions for
2 processing database query operations, wherein execution of the one or more
3 sequences of instructions by one or more processors causes the one or more
4 processors to perform the steps of:
5 in response to receiving a database query that specifies an operation for
6 manipulating data, performing the steps of,
7 referencing data in a relational structure as if the data was stored in a
8 multi-dimensional array;
9 retrieving the data from said relational structure; and
10 performing said operation previously specified in said database query.

- 1 28. The computer-readable medium of Claim 27, wherein:
2 the step of receiving a database query that specifies an operation comprises the
3 step of receiving a multi-dimensional array operation; and
4 the step of referencing data in a relational structure comprises the step of
5 referencing said data using said multi-dimensional array operation.
- 1 29. The computer-readable medium of Claim 27, wherein the step of retrieving the
2 data comprises the step of retrieving the data from one or more relational database
3 tables.
- 1 30. The computer-readable medium of Claim 27, further comprising instructions for
2 performing the step of storing said data in a non-relational structure; and
3 wherein the step of performing said operation comprises the step of performing
4 said operation in reference to said data stored in said non-relational
5 structure.
- 1 31. The computer-readable medium of Claim 27, wherein the step of performing said
2 operation comprises the step of repeatedly performing a series of manipulations on
3 said data until a particular criteria is satisfied.
- 1 32. A computer-readable medium carrying one or more sequences of instructions for
2 processing database query operations, wherein execution of the one or more
3 sequences of instructions by one or more processors causes the one or more
4 processors to perform the steps of:
5 in response to receiving a database query that specifies an operation for
6 manipulating data, performing the steps of,
7 retrieving a first set of data from a first relational structure;
8 storing the first set of data in a non-relational structure; and
9 manipulating the first set of data by performing the operation previously
10 specified in the database query.

- 1 33. The computer-readable medium of Claim 32, wherein the step of retrieving a first
2 set of data from a first relational structure comprises the step of retrieving said
3 first set of data from a relational database.
- 1 34. The computer-readable medium of Claim 33, wherein the step of retrieving said
2 first set of data from a relational database comprises the step of retrieving said first
3 set of data from one or more tables within said a relational database.
- 1 35. The computer-readable medium of Claim 32, wherein the step of storing the first
2 set of data in a non-relational structure comprises the step of storing the first set of
3 data within a spreadsheet application.
- 1 36. The computer-readable medium of Claim 32, wherein the step of storing the first
2 set of data in a non-relational structure comprises the step of storing the first set of
3 data in a non-relational database application.
- 1 37. The computer-readable medium of Claim 32, wherein the step of storing the first
2 set of data in a non-relational structure comprises the step of storing the first set of
3 data within an n-dimensional array data structure.
- 1 38. The computer-readable medium of Claim 32, wherein the step of manipulating the
2 first set of data comprises the steps of symbolically addressing the first set of data
3 as n-dimensional array information.
- 1 39. The computer-readable medium of Claim 32, further comprising instructions for
2 performing the step of, after performing the step of manipulating the first set of
3 data, storing in a second relational structure, result information based on
4 performance of said operation.

- 1 40. The computer-readable medium of Claim 32, wherein the step of
2 manipulating the first set of data comprises the step of repeatedly
3 performing a series of manipulations on said first set of data until a
4 particular criteria is satisfied.

PCT/US2007/063333